

RESTORATION OF NATIVE PLANT COMMUNITIES IN LONGLEAF PINE LANDSCAPES ON THE KISATCHIE NATIONAL FOREST, LOUISIANA

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Poster Summary

INTRODUCTION

In January 1993, the Kisatchie National Forest and Southern Research Station began monitoring the effects of various management practices on overstory and midstory trees, shrubs, and understory woody and herbaceous vegetation in several longleaf pine (*Pinus palustris* Mill.) stands. The monitoring of these stands is part of several Ecosystem Management Projects. These projects address the effects of different seasons of burning, group selection cutting, removal of off-site pine species, and shelterwood management on forest vegetation. One of our goals is to identify common plants that are usually present in longleaf pine forests once the silviculturist's objectives are met.

SEASON-OF-BURNING PROJECT

We are monitoring characteristics of vegetation in stands burned periodically in winter, spring, or summer to determine whether management activities are restoring old-growth attributes. On the Catahoula Ranger District (RD), the forests are on gently rolling uplands of Ruston and Smithdale (Typic Paleudults) sandy loams. On the Vernon RD, the forests are on gently rolling uplands of Malbis (Plinthic Paleudult) fine sandy loam. Hardwoods are more numerous on the Catahoula RD than on the Vernon RD. However, the overstories and midstories of the stands are dominated by longleaf pine with scattered loblolly pine (*P. taeda* L.), southern red oak (*Quercus falcata* Michx.), and sweetgum (*Liquidambar styraciflua* L.). Other species that may be present include flowering dogwood (*Cornus florida* L.), blackgum (*Nyssa sylvatica* Marsh.), blackjack oak (*Q. marilandica* Muenchh.), post oak (*Q. stellata* Wangenh.), black oak (*Q. velutina* Lam.), mockernut hickory [*Carya tomentosa* (Poir) Nutt.], sassafras [*Sassafras albidum* (Nutt.) Nees], and tree sparkleberry (*Vaccinium arboreum* Marsh.).

In the understory, woody plants and blackberry are kept in check by burning. Species present in significant numbers include southern red oak, flowering dogwood, blackberry (*Rubus* spp.), waxmyrtle (*Myrica cerifera* L.), blueberry (*Vaccinium* spp.), poison oak [*Toxicodendron toxicarium* (Salisb.) Gillis], and grape (*Vitis* spp.). Pine seedlings cannot grow well in these stands because the overstory basal areas range from 98 to 124 square feet per acre (ft² per acre).

The herbaceous species present in greatest numbers are pinehill bluestem [*Schizachyrium scoparium* var. *divergens*

(Hack.) Gould], low panicums (*Dichantherium* spp.), grassleaf goldaster [*Heterotheca graminifolia* (Michx.) Shinnery], swamp sunflower (*Helianthus angustifolius* L.), goldenrods (*Solidago* spp.), and bracken fern [*Pteridium aquilinum* var. *pseudocaudatum* (Clute) Heller].

GROUP SELECTION AND REMOVAL OF OFF-SITE PINE PROJECT

On five ranger districts, we are demonstrating that group selection and off-site pine removal can restore an uneven-aged structure to longleaf pine forests while sustaining habitat for threatened and endangered species and maintaining a diverse understory of herbaceous and woody plants. Conditions in these longleaf pine stands include a stand with a preexisting uneven-aged structure on the Evangeline RD, even-aged forest adjacent to savanna on the Kisatchie RD, and even-aged forest with a brushy understory on the Winn RD. An analogue of the uneven-aged longleaf pine forest type is the uneven-aged ponderosa pine (*P. ponderosa* Dougl. ex Laws.) forest type of the Western United States. In these forests, there are groups or clusters of trees of similar ages adjacent to other groups of another age class.

SHELTERWOOD PROJECT

On the Catahoula RD, we are monitoring seed crops and understory vegetation in a longleaf pine shelterwood with reserves. This shelterwood is on a Ruston and Smithdale rolling upland and has 35 ft² of basal area per acre. It was retained for red-cockaded woodpecker (*Picoides borealis*) habitat. The most numerous species in the diverse understory are pinehill bluestem, fringe nutrush (*Scleria ciliata* Michx.), grassleaf goldaster, pencilflower [*Stylosanthes biflora* (L.) BSP.], Texas dutchmanspipe (*Aristolochia reticulata* Nutt.), and bracken fern.

INDICATOR PLANTS

These monitoring efforts have led to interesting findings about herbaceous plant productivity and community health. Statistics from several sites that have been prescribed burned several times, but not within the last two growing seasons, are given in table 1. These results support several conclusions about herbaceous plant productivity: (1) herbage productivity in the pasture of native herbaceous vegetation is probably near the maximum for upland soils in central Louisiana without fertilization; (2) herbage yields decrease with increasing overstory basal

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Table 1—Selected stand information relating overstory and understory woody plant density to herbaceous plant productivity

| Stand description | Overstory basal area | Understory (pine seedlings not counted) | Current-year herbage production |
|---------------------------|----------------------------|---|---------------------------------|
| | <i>Ft²/acre</i> | <i>Stems/acre</i> | <i>Lbs/acre</i> |
| Native pasture | none | 6,900 (2.3 ft tall) ^a | 2,900 |
| Shelterwood with reserves | 35 | 9,900 (2.0 ft tall) | 1,700 |
| Longleaf forest | 98 | 12,500 (0.5 ft tall) | 1,500 |
| Longleaf forest | 106 | 65,200 (1.7 ft tall) | 670 |

^a Average height of understory stems, excluding pines.

area; and (3) once a pine overstory has reached full stocking, efforts to increase understory herbage production by rotary mowing or burning will have marginal success. If hardwood brush or a midstory is present, herbaceous productivity will decline even further.

Since herbaceous plant productivity does not necessarily respond to management treatment, how we determine whether a treatment affects the health of a herbaceous plant community should not be based solely on its productivity. Rather, the focus should be on species richness and species distribution. To this end, indicator plants can be used as barometers of herbaceous community health. Based on our work, indicators of a healthy understory in upland longleaf pine landscapes might include pinehill bluestem, swamp sunflower, and grassleaf goldaster. Indicator plants would help forest managers quickly recognize sites needing treatment and or those sites where no treatment is required so that managers could best allocate their resources. With limited training, forest personnel can recognize many plants year-round in the field. The use of pictures and computer images could help with identification.